



The Official Newsletter of the Gwinnett Amateur Radio Society

April 2022 <http://www.gars.org/> Volume 32, Issue 4



The

# GARzette

April 2022 GARS Meeting: What is DMR – Bob Hoffmann K4CQO



## The Georgia QSO Party



## TechFest

GARS January Exhibition of the  
Technical aspects of Amateur Radio  
held at the [Gwinnett County  
Fairgrounds](#)

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GARzette.

GARS Meeting – Tuesday April 12, 2022 at 7:00 PM

## President's Message

### From the President...

#### Education

GARS' Ham Cram Team executed another awesome session, again producing several new hams. This class was large, and as usual, our excellent instructors continued with high pass rates. Many thanks to our Ham Cram Instructors: Ralph (KJ4CNC), John (WB4QDX) and Jamie (KX4HA). Many thanks as well to our Volunteer Examiners who provided the testing session that followed.

#### Dog Show event

The Dog Show fund raiser activity has passed and both GARS and ARES will receive a decent little donation for our efforts. Many thanks go to the volunteers who braved one day of rain and each following day with a constant breeze. The Fairgrounds, the roads, and the paths in and around the buildings always present a challenge. The designated parking and camping areas present variables for everyone to consider and can be confusing to the attendees as they try to make their way through this maze to their destinations. Our instructions can make all the difference to the attendees and the competitors. All in all, we did well with our efforts. We do need to show appreciation to these volunteers for putting in their time on behalf of GARS. Thank you!

#### Dacula Memorial Parade

Our next volunteering opportunity will be the Dacula Memorial Parade. GARS has been helping with this for many years, and dare I say, we are essential in getting the parade participants organized and out the door of the staging area to the parade route on time. This parade is a lot of fun too, being amongst the floats, the cars, the marchers, the horses (not behind though) and the general excitement generated by this parade. Please consider signing up to volunteer for this on [www.gars.org](http://www.gars.org).



[<click here>](#)

#### Field Day

Though a few months away, it is never too early to start thinking about Field Day 2022. Setting aside the great food we always have, band conditions looking up and the camaraderie, Field Day is a good place to attend in order to experience a new form of Ham radio or to just challenge yourself in a particular

facet. See the volunteer signup sheet at [gars.org](http://gars.org).

#### What Is It?

Having processed a large quantity of Silent Key ham radio items, I occasionally come across an item that I cannot identify. That being said, I do know what many of the objects are too. So, we'll see about recognizing those of you who get it right.



This object is something I DO NOT know what it is. If you can identify the shown object, please email me at [ad4pz@arrl.net](mailto:ad4pz@arrl.net)

17"x2.1"x1". Metal brackets on each end and no apparent seam in the black material. What is it?

73,

*Joe Biddle, AD4PZ*

**Club President**



The

GARzette

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## GARS Communication

|   |  |   |
|---|--|---|
| <b>2 Meter Repeaters</b><br>147.075(+) MHz Tone 82.5<br>147.255(+) MHz Tone 107.2<br><b>1.25 Meter Repeater</b><br>224.580(-) MHz Tone 100.0,<br>1.6 MHz Offset<br><b>70 Cm Repeaters</b><br>444.525(+) MHz Tone 82.5<br>442.100(+) MHz Tone 100<br>442.325(+) MHz Tone 100 | <b>6 Meter Repeater</b><br>53.110 (-1 MHz) No Tone<br>(Offline for Maintenance)<br><b>Other Resources:</b><br><b>APRS</b><br>144.390 -- 1200 Baud<br>W4GR<br><b>D-STAR</b><br>WD4STR<br>145.060 + (1.4 MHz)<br>440.550 + (5 MHz) | 6M<br>147.075<br>147.255<br>224.580<br>442.100<br>Springs<br>442.325<br>444.525<br>Link remote receivers being added<br>Currently down<br>Operational in Snellville<br>Operational in Snellville<br>Operational in Grayson<br>Operational at Goshen<br>Operational in Buford<br>Operational in Snellville |
|---|--|---|

## Notable Web Links

Ham Radio Glossary: <https://noji.com/hamradio/glossary.php> a very comprehensive listing provided by Noji Ratzlaff KNØJL. On his site there is also a lot of information about getting started in ham radio.

## Need Help – Let GARS Elmers answer your questions

Send an email to [elmers@gars.org](mailto:elmers@gars.org) with the subject listing the area (like Antennas, Repeaters, Digital, DMR etc.) of your query to get to GARS Elmer volunteers.

The *GARzette* is the official monthly newsletter of the Gwinnett Amateur Radio Society, serving its members and other persons interested in the advancement of the Amateur Radio art.

Original articles, art, and photos are invited and encouraged. Previously copyrighted submissions cannot be accepted for reprinting unless permission from the appropriate publisher is provided in writing along with the information being submitted. If reprints are from publications allowing their unrestricted use, please include a copy of the printed permission contained in the publication.

If possible, bring your articles to the monthly meeting in Microsoft Word or rich text (.rtf) or text or HTML format or by e-mail to [editor@gars.org](mailto:editor@gars.org). Artwork can be accepted in most any graphics format and can be submitted via e-mail to the same address. Alternate means of submittal can be arranged when necessary.

In keeping with the Amateur Radio spirit, permission is hereby granted for the reproduction of The *GARzette* articles by other Amateur Radio club newsletters provided that proper credit is given to the individual author and *The GARzette*.

*The GARzette* is published each month with the assistance of Karen KI4HPP and Kyle W4KDA who print copies for distribution at meetings, etc. and Dave Bruse, W4DTR, who distributes the newsletter electronically.

Deadline for submissions is the 28th of each month for inclusion in the following month's issue.

For additional information view our Website at: <http://www.gars.org>

Newsletter Email: [editor@gars.org](mailto:editor@gars.org) Editor: Bob Hoffmann, K4CQO Assistant Editor: Bill Eggers, WB2RIS



GARS.org

## GARS HELP WANTED

Speakers Needed for GARS Workshop Presentations, 3<sup>rd</sup> Tuesday of the month – Email [workshop@gars.org](mailto:workshop@gars.org) to volunteer. [PS— Articles to publish in the *GARzette*, either written by GARS members or published elsewhere, are always welcome. —Ed.]

## GARS Meetings & Workshops

### GARS Meetings and Workshops

GARS Meetings and Workshops are held in-person at the EAA 690 Hangar. Zoom simulcast of Meeting & Workshop information will be listed on <http://www.gars.org>.

**Meetings and Workshops are OPEN to all, feel free to share your invite with others.**

Zoom login info will be posted to <http://www.gars.org> prior to the meeting.

#### When events are available on Zoom

- Workshops and Meetings will be **recorded**. By participating you consent to being **recorded**.
- Please change your display name to Your **FirstName Call Sign**, e.g. Hiram W1AW
- [How to change Your Display Name in Zoom](#)
- Please stay muted until ready to speak. Your space bar works like a PTT for un-muting
- To be fair to everyone, there will be a three minute limit for each person during Q & A
- You may ask questions in chat; **please stay on topic while using chat.**

#### GARS Meetings Schedule (second Tuesday @ 7:00 PM): (these are the presentations)

- April 12, 2022 – DMR, What is it and how to use it - Bob Hoffmann K4CQO
- May 10, 2022 - Re-capping and tube testing to bring radios back to life - Don Woodward KD4APP
- June 14, 2022 - Final Preps for GARS Field Day
- July 12, 2022 - How to build a 4-element, 2m, Cubical Quad Antenna - Dallas N4DDM
- August 9, 2022 - Winlink email via Amateur Radio - Mark Bell N7GRB
- September 13, 2022 - **OPEN**
- October 11, 2022 - GARS Show-n-Tell - The Hand-on Workshop

#### Workshop Schedule (third Tuesday @ 7:00 PM): (these are the Hand-on Workshops)

- April 19, 2022 – DMR, Programming your HT / Hotspot - Bob Hoffmann K4CQO
- May 17, 2022 - Re-capping and tube testing to bring radios back to life - Don Woodward KD4APP
- June 21, 2022 - Final Preps for GARS Field Day
- July 19, 2022 - How to build a 4-element, 2m, Cubical Quad Antenna - Dallas N4DDM
- August 16, 2022 - Winlink email via Amateur Radio - Mark Bell N7GRB
- September 20, 2022 - **OPEN**
- October 18, 2022 - GARS Show-n-Tell - The Hand-on Workshop

#### GARS Meeting – April 12, 2022

Digital Mobile Radio (DMR) - Bob Hoffmann [K4CQO](#)



Bob is giving a presentation on Digital Mobile Radio (DMR). His presentation will address using DMR for ham radio and how it differs from making a contact using SSB.

Some of the topics to be covered:

- Formation of the DMR signal
- What are TGs
- How to access a TG
- The steps to program DMR

#### GARS Workshop – April 19, 2022

Digital Mobile Radio (DMR) - Bob Hoffmann [K4CQO](#)

Bob will complete his presentation of Digital Mobile Radio (DMR) that he started the week before at the GARS Meeting. The focus will be getting a "Code Plug" configured and loaded into your radio. Bring your laptop, radio, and programming cable. **This will be an in-person Workshop.**



## GARS Happenings

### 20 Years ago in the April 2002 GARzette:

- There was a 2002 TechFest summery – it was a great success
- Field Day Chairman, David Adcock, KA4KKF, started planning Field Day (David is our 2022 Field Day Chairman!)
- Interesting article about QRP Power Sources (a lot has happened in the last 20 years)

You can always browse the GARzette archive at <http://www.gars.org/newsletters> and go directly to the 2002 GARzette by clicking on the image. 73, Bob, K4CQO, GARzette Editor



### Health and Wellbeing – Sandy Jackson, KJ4DRO

Look for this resource on [gars.org](http://www.gars.org) and use it as a means to convey information about a GARS family member or Silent Key notification.

## Net Managers Corner

### Monday Night 2 Meter “Want, Swap, Sell, and Information Net”

#### **GARS NEEDS MEMBERS TO SERVE AS NET CONTROL STATIONS!**

GARS is a great Amateur Radio service club with the membership and awards to prove it. Our club is very busy and active, and we use the Monday night net to get timely information out to our members. Weekly participation is needed to make our net function well. There is only a small group of very dedicated people who make the net happen each week, and we need more members to volunteer to serve as Net Control Stations (NCS) on a rotating basis.

Out of almost 300 members, there are only seven operators who serve as the NCS for the GARS net every Monday night. In no particular order, they are:

|              |                 |                |                  |
|--------------|-----------------|----------------|------------------|
| Don – KW4AL  | Ray – N4GYN     | Bill – WG9NUW  | David – KA4KKF   |
| Glen – W3WWT | Russell – AB4QQ | Chuck – KK4TKJ | Charlie – WS4TOT |

As GARS Net Manager (Chuck KK4TKJ), I would like to have more volunteers to fill NCS positions. I do plan and post the schedule months in advance. Any conditions will be accommodated that you as a rotating NCS need to place on the scheduling of your duties. If your plans change, I can make adjustments for the schedule to work, and I will make those changes happen as soon as I am notified of a problem. As Net Manager, I also send out reminders each week to let the NCS scheduled know he or she is NCS for the next Monday night net. In short, serving as a rotating NCS is a small duty but a great contribution to the club. The “Want, Swap, Sell Information Net” begins promptly at 19:30 every Monday night and runs about 30 minutes. As a scheduled NCS, you will request the assistance of a volunteer alternate NCS each time you have Net Control. Your simple duties will be to tune in to the GARS repeater, read the script, take a few notes and forward the information to me for record keeping.

Please lend a hand and contact me (Chuck) at [KK4TKJ@arrl.net](mailto:KK4TKJ@arrl.net). Sign up to help support the effort that makes GARS the great club that it is. 73 and see you on the Nets!

## **GARS March Special Test Sessions**

### **GARS HamCram Technician Testing**

*Class was held Saturday, March 26, and Sunday, March 27*

We had a great exam session at our Technician HamCram class. We had 14 applicants. Thank you Ralph KJ4CNC, John WB4QDX and Jamie KX4HA for volunteering your entire weekend to teach our HamCram class!

Exam session results:

GARS welcomes the 11 new Technicians to the world of ham radio:

- KO4ZDC – Philip Bullock
- KO4ZDD – Lawrence Deese
- KO4ZDE – Christine Dwyer
- KO4ZDF – Dorian Flowers
- KO4ZDG – Jonathan Jones
- KO4ZDH – William Nash
- KO4ZDI – Cesar Rodriguez
- KO4ZDJ – Laurie Rodriguez
- KO4ZDK – Craig Smith
- KO4ZDL – Michael Smith

Special thanks to our Volunteer Examiners who made this exam session possible:

Pam, WB1AKQ  
Bob, K4CQO  
Richard, KM4SWL  
Russell, AB4QQ  
Frank, KV4SP  
John, WB4QDX  
Alex, AK4AM  
Bill, WR1TR  
Donna, KM4FMW  
Ralph, KJ4CNC  
Chuck, KK4TKJ (Co-CVE)  
Jamie, KX4HA

Thanks & 73,

Dave Bruse, W4DTR (CVE)  
GARS VE Team Leader

### **McConnell Middle School Testing**

*Was held Wednesday, March 23*

We had a good exam session at McConnell Middle School. We had 9 applicants. Thank you Ralph, KJ4CNC for keeping the McConnell Middle School Radio Club going!!!

Exam session results:

- 1 new Technician

Special thanks to the Volunteer Examiners who made this exam session possible:

Earl, AF4FG  
Russell, AB4QQ  
Don, KK4NJM (Co-CVE)  
Donna, KM4FMW  
Ralph, KJ4CNC  
Bob, K4CQO  
Chuck, KK4TKJ (Co-CVE)  
Richard, KM4SWL

## Antenna Party at Newton Rockdale PHD

### Antenna Party at Gwinnett Newton Rockdale Public Health Department

*March 3, 2022*



Larry (AB4NX) left, Dallas (N4DDM) right



Mark (N7GRB) at station

As part of our local commitment to served agencies in Gwinnett County, our ARES team serves the Gwinnett Newton Rockdale (GNR) Public Health Department headquarters. On a monthly basis we perform radio station checks and other needed maintenance. Our objective, to ensure the station is ready if called on in support of emergency communications.

This month (March 3rd) three volunteers from Gwinnett ARES formed an antenna party. There was some question about the existing Yaesu YA-30 HF folded dipole's performance. The decision was made to swap the HF antenna out for another YA-30 and while doing so replace the over seven-year-old guideline cord.

In coordination with the GNR facilities director, Larry Whited (AB4NX) and Dallas Mellichamp (N4DDM), wearing appropriate safety gear, formed the roof-top team. Mark Bell (N7GRB) provided ground support (gopher) and radio test operator. While on the roof Larry and Dallas observed deteriorated coax with exposed shielding leading to a pair of high frequency Yagi antennas. While these antennas are not associated with the amateur radios, the team took pictures for a subsequent report to the facilities director.

While the GNR radio station is in a small space, it is strategically attached to the GNR District Operations Center (DOC). One can literally turn around at the operator's position and pass or receive message traffic through the room door with the incident command staff. The station is well equipped with an ICOM IC-7300 HF radio, ICOM ID-5100 dual band DSTAR radio, Yaesu FT-8800 dual band with attached Kantronics KPC3+ TNC and lastly a dedicated PC with printer. The entire setup is on an AC circuit backed by a generator.

Mark T. Bell, N7GRB

AEC Public Health Gwinnett Co. ARES

Georgia Section Technical Specialist

## FCC License Fee Starting



**ARRL** The National Association for  
Amateur Radio®

### Important Message from ARRL VEC, By Maria Somma, AB1FM, ARRL VEC Manager

The FCC released a [Public Notice](#) on March 23, 2022, stating that the amateur radio application fees, including those associated with Form 605 application filings, would become **effective on April 19, 2022**. The Federal Communications Commission's authority to impose and collect fees is mandated by Congress.

The \$35 application fee, when it becomes effective on April 19, will apply to new, renewal, and modification applications that request a new vanity call sign. The fee will be per application.

Administrative updates, such as a change of name, mailing or email address, and modification applications to upgrade an amateur radio licensee's operator class\*, will be exempt from fees. (\*this new information was just confirmed by FCC staff on Tuesday, March 29.)

### VECs and Volunteer Examiner (VE) teams will not have to collect the \$35 fee at exam sessions.

Once the FCC application fee takes effect, new applicants will pay the \$15 exam session fee to the ARRL VE team as usual and pay the \$35 application fee directly to the FCC by using the CORES FRN Registration system. VEC and VE team licensing procedures will not change.

When the FCC receives the examination information from the VEC, it will email a link with payment instructions to each qualifying candidate. The candidate will have **10 calendar days**, from the date of the application file number being issued, to pay. After the fee is paid, and the FCC has processed an application, examinees will receive a second email from the FCC with a link to their official license or, in very rare instances, an explanation for why the application was dismissed or denied. The link will be valid for 30 days.

Per usual procedures, examinees that pass multiple exams at one session, will have one application transmitted to the FCC reflecting the highest-level license class earned. Again, our procedures will not change. The new license candidates will have an extra step before the license is issued. VE teams can point candidates to our FCC Application Fee webpage. Our new ARRL VEC CSCEs also include information about the application fee and points candidates to the webpage. The FCC rule pertaining to CSCEs will not change. CSCE credit will continue to be valid for 365 days, starting from the date of issuance.

For VE teams holding exam sessions the weekend before April 19, the FCC advised that applications not received by the FCC before April 19 will be subjected to the fee. The ARRL VEC urges teams to upload sessions via our documents upload page to get your sessions to us as quickly as possible. Assuming the FCC electronic batch filing (EBF) system is functioning properly on Monday, April 18, the VEC staff will work to get these to the FCC before April 19. Email the VEC department at [VEC@arrl.org](mailto:VEC@arrl.org) for the upload instructions.

Additionally, the FCC stated that the fee for applications processed and dismissed will not be refundable. This includes vanity requests where the applicant does not receive the requested call sign. However, returned applications that are missing information will not require an additional fee, if the missing information is submitted to the FCC within the proper amount of time.

### Youth Licensing Grant Program

Anticipating the implementation of the fee in 2022, the ARRL Board of Directors, approved the ARRL Youth Licensing Grant Program in July 2021. Under the program, ARRL will cover a one-time \$35 application fee for license candidates younger than 18-years old for tests administered under the auspices of the ARRL Volunteer Examiner Coordinator (ARRL VEC). Qualified candidates also would pay a reduced exam session fee of \$5 to the ARRL VEC. ARRL is finalizing details for administering the program.

[Ed Note: GARS administered VE tests are W5YI administered and not ARRL administered tests.]

Further news and instructions will follow as the FCC releases them. Details for the ARRL Youth Licensing Grant Program will be posted when available. For additional information, visit the resources below.

ARRL News Story: [arrl.org/news/new-amateur-radio-license-applications-fee-to-become-effective-april-19-2022](https://arrl.org/news/new-amateur-radio-license-applications-fee-to-become-effective-april-19-2022)

FCC CORES Video Tutorials: [fcc.gov/licensing-databases/fcc-registration-system-cores/commission-registration-system-video-tutorials](https://fcc.gov/licensing-databases/fcc-registration-system-cores/commission-registration-system-video-tutorials)

FCC Registration Help: [apps.fcc.gov/cores/publicHome.do?help=true](https://apps.fcc.gov/cores/publicHome.do?help=true)



## Swan 350 and 500 Transceivers

### Vintage Amateur Radio

de Bill Shadid, W9MXQ



I am going to jump out of order within the history of a manufacturer this month – beginning in the middle of the company’s time in the ham radio business. We are going to cover one of the most successful pair of transceivers in ham radio history – made at the pinnacle of operations for Swan Electronics of Oceanside, California. Any ham around in the 1960’s and 1970’s knows and remembers Swan, one of the dominant ham radio manufacturers. They remain with us to this day as the current and successful, Cubic Corporation.

As a young ham in the 1960’s, I had a keen interest in the Swan 350 and 500 series transceivers. This month we will look at the genealogy of these two very related transceivers. Let’s move back to the times when main stream ham radio technology was just beginning to incorporate some solid-state circuitry. Swan’s engineering department was moving along, like Drake and Hallicrafters, to take sections of established tube designs (VFO’s, carrier oscillators, i-f stages) and moving them to solid-state circuitry. Here are the last versions of the original design 350 and 500 transceivers that are part of the W9MXQ collection of vintage ham radio equipment:



**Swan 350c HF Transceiver with 117xc Speaker/PS  
(Shown with Turner 454C Microphone)**



**Swan 500cx HF Transceiver with 117xc Speaker/PS and 508 VFO  
(Shown with Turner 254C Microphone and Johnson Speed-X Key)**

The Swan 350 Transceiver was introduced in 1964 as a deluxe HF Transceiver to replace Swan’s previous lines of single band transceivers (SW-175, SW-140, SW-120, and SW-115 – 75, 40, 20 and 15 meters, respectively) and single tri-band transceiver (SW-240 with 80, 40 and 20 meters). The single band units were essentially SSB Transceivers – with no way to even switch sidebands. The tri-band SW-240 did offer both CW and AM to their SSB focused design. Swan never made radios that did not include single sideband.

As originally released – here is the Swan 350 Transceiver:



## Swan 350 as Originally Released in 1964

Looking at the 350 Transceiver you can see a nice looking anodized and screen panel (the same paint system used by Drake and a few others) to give a nice appearance in keeping with design at the time. Swan, who had based their marketing on performance with few thrills, did not offer extra features on the radio. Note that there was no standard selectable sideband (an add-on kit was marketed for that) and no crystal calibrator (another add-on kit). The radio offered SSB and CW modes. It also offered AM but only as a carrier inserted into the SSB signal. Unlike the Drake TR-4, there was no AM detector so the SSB receiver section was also used for AM. CW was possible but as in the Drake TR-3 and TR-4, there was no separate receiver tuning (RIT) to make listening more comfortable. Like Drake and Collins – CW was an afterthought. Swan did not even offer a CW sidetone in the 350.

In 1967, Swan added the more feature rich, model 500 Transceiver to their lineup. Here is the Swan 500:



## Swan 500 as Originally Released in 1967

Apparently, sales of the options to add selectable sideband and a crystal calibrator on the 350 were strong. Or, perhaps customer feedback was telling Swan that a more complete transceiver was desired. Thus the 500 came to the market.

Both the 350 and 500 used 6HF5 final amplifier sweep tubes in matched pairs. In fact, the 350 and 500 shared many, if not most, circuitry and mechanical components. The 500 added such niceties as an Automatic Noise Limiter (ANL), Selectable Sideband, a 100kHz Calibrator, and CW sidetone to the standard features offered to the buyer of the 350 model.

It is interesting to note that while the power amplifier circuitry and power supply were the same for the Swan 350 and Swan 500, they had different power specifications. Remember that in those days, radios

were shown with power input specifications. They did not show power output specifications. For comparisons I have added expected power output information to the chart, below:

| Swan Model | Mode | Power Input (Watts) | Power Output (Watts) |
|------------|------|---------------------|----------------------|
| 350        | SSB  | 400                 | 200                  |
|            | CW   | 320                 | 160                  |
|            | AM   | 125 (Carrier)       | 60 (Carrier)         |
| 500        | SSB  | 480                 | 240                  |
|            | CW   | 360                 | 180                  |
|            | AM   | 125 (Carrier)       | 60 (Carrier)         |

In 1968, Swan made some significant upgrades to the two flagship models. Conversion schemes were changed to correct older issues with VFO stability. To designate this change, most post-update models of Swan radios added a suffix of “c” to the models. So, the Swan 350 became the Swan 350c and the Swan 500 became the Swan 500c. In addition to the incorporation of improved stability, Swan upgraded the power amplifier tubes in the 350c and the 500c and changed to the more robust 6LQ6 final amplifier sweep tubes in matched pairs. Later versions of both of the “c” version transceivers moved to a solid-state carrier oscillator for even more stability.

The net result – in power amplifier power – of the upgrade to the 6LQ6 final amplifier can be seen in the chart below that shows the increased input and output but also that Swan abandoned the idea of making the 500c look more powerful than the identical amplifier in the lower cost 350c.

| Swan Model | Mode | Power Input (Watts) | Power Output (Watts) |
|------------|------|---------------------|----------------------|
| 350c       | SSB  | 520                 | 260                  |
|            | CW   | 360                 | 180                  |
|            | AM   | 125 (Carrier)       | 60 (Carrier)         |
| 500c       | SSB  | 520                 | 260                  |
|            | CW   | 360                 | 180                  |
|            | AM   | 125 (Carrier)       | 60 (Carrier)         |

The Model 350c retained the spartan offering of the 350 with no selectable sideband, no crystal calibrator, no noise limiter, and no sidetone for CW. It did, however, provide the most power for the lowest cost in the industry.

As we talk about powerful transceivers of the day, it must be remembered that average talk power from these radios may not have equaled what we see today with fully equalized and compressed transmit audio for today’s sophisticated 100-watt radios. The Drake TR-3 and TR-4, the Swan radios in this article, the Galaxy Transceivers, the British KW Transceivers, and the National NCX-500 lacked the overhead in their power amplifiers to use relatively high levels of compression and other means to increase talk power.

Another change came in 1970 when Swan responded to Incentive Licensing and license privileges tied to license class. Now the HF bands were divided into separate areas for Novice, General, Advanced, and Extra Class licensees. Before that, the bands were divided into Novice and then identical frequency privileges for General, Advanced, and Extra Class licensees. These involved some divisions requiring a crystal calibrator on multiples of 25 kHz, rather than the long traditional 100 kHz. Swan used that change to be part of the justification of the newer Model 500cx HF Transceiver. The 500cx looks nearly identical to the 500c but includes a selectable 100 or 25 kHz calibrator, general stability improvements at the component level, and a very much improved CW monitor.



At the time of the release of the 500cx, Swan had seen fit to squeeze another 30 watts input on SSB out of the hard working 6LQ6 final amplifier tubes as you can see here:

| Swan Model | Mode | Power Input (Watts) | Power Output (Watts) |
|------------|------|---------------------|----------------------|
| 500cx      | SSB  | 550                 | 275                  |
|            | CW   | 360                 | 180                  |
|            | AM   | 125 (Carrier)       | 60 (Carrier)         |

By this time, the place for the economical 350c had run its course on the premium market for Swan – and it was discontinued. Not to be left out, however, because about that time along came the Swan 260 and deluxe version Swan 270 Cygnet Transceivers. They were 260-watt input SSB Transceivers using a single 6LQ6 final amplifier – and came with an internal AC Power Supply that offered a truly cost reduced product to attract entry level ham radio operators.

Swan offered many accessories for the 350, 500, 350c, 500c, and 500cx models. While not a subject for this article, Swan was also very successful in the VHF market with two SSB/CW/AM transceivers for 6-meters and even 2-meter FM Transceivers.

The accessories for the transceivers in this article include two linear amplifiers for which I have little information. They were the Swan Mark I and the Swan Mark II, as shown here in these pictures:



**Swan Mark I HF Linear Amplifier  
(with built-in AC Power Supply)**



**Swan Mark II HF Linear Amplifier  
(shown with separate Power Supply)**

The Mark I used a pair of Eimac 3-400z triodes. The Mark II changed to using Eimac 3-500z triodes in the final amplifier. You can see that the two amplifiers were configured differently and represented a complete re-design. Unlike some amplifiers of the time, the design of the Mark I allowed for installation to replace the now impossible to replace 3-400z tubes. Both amplifiers lacked a tuned input circuit so are somewhat difficult to use with today's solid-state exciters.

Swan offered a variety of External VFO units for the 350 and 500 transceivers and separate offerings for the 350c and 500c. The later units had to be changed due to Swan's change of conversion frequencies in the "c" model radios. You can see the last of these VFO's in the picture on the first page of this article – pictured next to the W9MXQ Swan 500cx station. This is the model 508 that includes all necessary switching for using the transceiver's internal VFO, or the 508 external VFO, or a split between the two.

The 508 External VFO was a great improvement in implementation because the previous units did not include any way to switch the VFO into the circuit. That was accomplished by a plug-in accessory (Swan Model 22 Adapter) that was installed using the rear panel External VFO socket. The Model 22 cabinet extended to be just above the radio and the user would reach to the back side of the transceiver to access a switch to allow operation from the Transceiver VFO, the External VFO, or a Split between the two.



Many hams at the time would build their own switching for the External VFO. Below is my own 1970 vintage station, in Quincy, Illinois, when I was WA9MXQ:



### Here is a 1970 Vintage Swan Station at W9MXQ (then WA9MXQ)

You can see, left to right, the Swan 117xc Power Supply/Speaker Console, the Swan 350c Transceiver, and the Swan 410c External VFO. Sitting on top of the VFO is the homebrew switch box that allowed VFO A (Transceiver), split with VFO A on Receive and VFO B on Transmit, or VFO B (External VFO). Also, in that picture – to the right, bottom to top, are a home brew 500-watt antenna tuner, a home brew SWR Bridge/Power Meter, and a home brew Audio Speech Processor. Also shown are a US Navy surplus Morse key and a Turner 254C Microphone. The key and microphone are still with me. I can only wish the home brew items were still part of my station. Incidentally, look carefully at the Swan 350c, above, and compare it to the one on the first page of this article. In the picture from 1970, notice just under the “Swan 350c” nameplate (below the meter) that I had added switches for VOX/PTT selection and an on off switch for ANL (Automatic Noise Limiter). I copied the circuitry from the Swan 500c and added that to my radio. Also, I added a 100kHz Crystal Calibrator to my Swan 350c.

The Model 410c External VFO was a modification of the original Model 410 External VFO that worked with the original 350 and 500 (not “c”) radios. They looked very much like the Model 508 VFO that I use now except that the Model 508 includes the features of the Model 22 Adapter – no more need to home brew that feature!

As a proud father I would be remiss in not showing you the other picture that I snapped the same day as the one above. This is our daughter, Bonnie, as she was making a visit to the basement shack, back in 1970. She is now a lawyer plying the floors of the Illinois General Assembly and is the former N9OIE

...

This is Bonnie, sitting at that same Vintage Swan Station. See the home brew VFO Adapter on top of the 410c VFO and check out the Trimm Headphones on that ham radio debutant’s head. Also, in view are the vintage Sony Reel Tape Player/Recorder, an ARRL Log Book (sitting on top of a 1969 ARRL Handbook), an Allied Radio Catalog, and a pair of HV Transformers soon to be included in a home brew linear amplifier using a pair of 833A Triodes. The Sony Tape Recorder is sitting on an Ampex Reel to Reel Console (absent the Ampex machine!!). The Log Book and the Handbook are still here at W9MXQ, the key remains here, and ex-N9OIE is here several times a year. The 833A Linear Amplifier, at last report, is still in operation and still says, “Contempora Seventy” (my home brew equipment “brand”) on its front panel.



Okay, so I drifted off a bit – but these articles are about nostalgia, are they not?

Swan marketed a lot of other accessories with Phone Patches, Antenna Tuners, Antennas (mobile and fixed station), AC and DX Power Supplies, Noise Limiters, Noise Blankers, and other transceivers in the mix. Swan even made a line of separate receivers and a transmitter. Other Swan products will be the subject of a future article or maybe a few articles.

At the time of these products, the ham radio industry was in a power race that ran to the point where Swan had a version of the 500cx, called the 700cx, with 700 watts PEP SSB input power. It is interesting to check the competition at the time. Swan always led the pack in maximum power. But, the others played in the game as well with Drake, Galaxy, Hallicrafters, KW Electronics, and National in the game along with Swan to see who could get the most power out of a table top, single box (plus power supply) cabinet. For a look at the contenders, check this group of pictures from the time of the Swan transceivers in this month's article:



**Swan 500cx \***  
(550 Watts PEP)



**Drake TR-4 \***  
(300 Watts PEP)



**Galaxy GT-550**  
(550 Watts PEP)



**Hallicrafters SR-400 \***  
(400 Watts PEP)



**National NCX-500 \*\***  
(500 Watts PEP)



**KW Atlanta**  
(500 Watts PEP)

Three of the above are in the W9MXQ collection right now (\*). One of them (\*\*) lives here in an earlier version (the NCX-200). But, all of them have been here at one time or another. How many of these do you remember? These were fine radios. I add these comments about them (strictly from personal experience, mind you):

1. Best and most robust construction – the Hallicrafters SR-400.
2. Best receiver – the Hallicrafters SR-400. (Also, most expensive.)
3. Best able to run at high power for long periods of time – the Swan 500cx.
4. Best mechanical/tactile “feel” to operate – the Swan 500cx.
5. Most exotic – the KW Atlanta.
6. Most nostalgic – the National NCX-500.
7. Most successful – the Drake TR-4.
8. Most design generations – the Galaxy GT-550.

Swan enjoyed a wide following and once dominated the ham radio marketplace.

A special thanks go to Bob, W9DYQ, for his proof reading. I appreciate that you read my articles. Remember that I am open to questions and comments at my email address, [W9MXQ@TWC.com](mailto:W9MXQ@TWC.com).

**W9MXQ**

The entire article is available on-line, see  
[http://www.gars.org/newsletters/2022\\_03\\_GARZETTE.pdf](http://www.gars.org/newsletters/2022_03_GARZETTE.pdf)



The

## GARS Membership

### New Members List in March

Alan Janssen (KO4YPS)  
Janette Janssen  
Michael Sheaffer (W4ANO)  
Edina White (KN4LQA)

**New Members: 4**

**Total Members as of  
March 31, 2022  
353**

Join GARS members for our weekly  
breakfast gathering at  
7:30 AM most Saturdays  
Now at  
Cracker Barrel Restaurant  
75 Celebration Dr.  
Suwanee, GA 30024

### Birthdays in April

Sadiya Bilal (KE0CJY)  
Angelo Bione (WB9RWL)  
Jim Boyd (KJ4YN)  
Trey Bradley (KO4LOR)  
Paul Branson (KA4YZR)  
Donna Broome  
Doris Brown  
Charles Burts (K4CHB)  
Mark Case (K5MTC)  
Scott Deitchman (WB8ICQ)  
Chet Dickenson (KM4FMO)  
Ana Luz Dominguez (KF4UOC)  
Lisa Fischer  
Emma Guidry (K4ECG)  
Jonn Heath  
Janette Janssen  
Stan McDonald (KI4H)  
Richard Morris (KG4BVU)  
Michael Parrott (N4MEP)  
Gemarl Perry  
Russell Prevost (AB4QQ)  
Brad Scarlett (KE0CKW)  
Linda Tcimpidis (W6LWT)  
Keith Wells (WA8B)  
Evelyn Whalen (KE4PLW)

### GARS MEMBERSHIP

Your current GARS membership status is shown in the monthly newsletter e-mail towards the bottom of the message. To become a GARS member, or to renew your GARS membership, please visit our website—<http://www.gars.org>. To make changes to your GARS membership (moved, new e-mail address, new phone number, etc.), please e-mail the Membership Committee - [membership@gars.org](mailto:membership@gars.org). You can renew or update your Amateur Radio license information with the FCC at their website for free <http://wireless.fcc.gov/uls/index.htm?job=home>. To update your ARRL information, please visit their website - <http://www.arrl.org>. Membership Chair: Karen Albritton, KI4HPP Committee Members: Dave Bruse, W4DTR



## Donating to GARS

Your GARS donation can be used for a certain purpose by donating to one of these funds:

- GARS SK Memorial Fund for Education (to remember and honor Silent Keys);
- GARS Scholarship Fund (Administered by the ARRL for awarding scholarships);
- GARS General Fund (any club purpose).

GARS has joined these rewards programs (a portion of every purchase you make through these merchants may be donated to GARS):

- Amazon Smiles;
- Kroger Community Rewards program.

For more information on how to sign up for these rewards programs, or to donate to GARS, visit

<http://gars.org/gars/donations-to-the-club>

## GARS on Social Media



Discord Request:

<http://gars.org/discord>



Groups.io:

<http://gars.org/groups.io>



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Lawrenceville, GA 30049

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Jamie Burns, Vice President KX4HA



Bill Hawkins, Secretary WR1TR



Pam Meridy, Treasurer WB1AKQ



Kevin Scott, Program Manager K4GTR

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Dave Bruse, VE Team Leader W4DTR



David Adcock, Webmaster and Field Day Chair KA4KKF



Ralph Pickwick, Apparel Manager and Education Chair KJ4CNC



Glen Wendt, TechFest Chair W3WWT



Bob Hoffmann, GARzette Editor K4CQO



Eddie Foust, Repeater Chair WD4JEM



Mike Weathers, WAS / DXCC QSL Card Checker and Historian ND4V



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Kyle Albritton, Multimedia Chair W4KDA



Don Stewart, Elmer Manager KW4AL



Sandy Jackson, Health and Wellbeing KJ4DRO

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Open Georgia QSO Chair  
Open Workshop Leader

## Directors and Trustees



John Davis, WB4QDX



Rick Cobb, N4XYY



Kyle Albritton, W4KDA



Bill Cherepy, WB4WTN W4GR Trustee





The

## GARS Meeting Minutes

### Gwinnett Amateur Radio Society – GENERAL MEETING MINUTES

**3/8/2022**

In person and online meeting.

**President Joe Biddle (AD4PZ) and Opened the meeting at 7:00pm and closed the meeting at approximately 9:00pm**

**Participants:** 33 in person – 24 Online

**New hams and visitors:** Joe (AD4PZ)

- No new hams, upgraded licenses, first time visitors

**Treasurer's Report:** Pam (WB1AKQ)

**Membership:** Karen (KI4HPP)

- Karen reported 350 members

**Education and GARS wear:** Ralph (KJ4CNC)

- Technician Ham Cram on March 26–27. Exam after second class

**Volunteer Examiners:** Dave (W4DTR)

- This Sunday at EAA Hangar. Doors open at 1:30.

**ARES:** Jamie (KX4HA)

- No weather spotter classes in person but online sessions will be listed on the Weather.gov web site.

**Programs:** Kevin (K4GTR)

- April - Bob Hoffman - DMR
- May – Don Woodward – Recapping and tube testing.

**Workshop:** Dallas (N4DDN)

- Each month will reflect that month's program

**Repeaters:** David (KA4KKF)

- New repeater is currently running 100 watts out. As soon as we have the info, we will have Echolink up.

**Dog Show:** Ralph (KJ4CNC)

- Last weekend of March and into April
- Volunteers needed. Register on the GARS site.

**GA QSO party:** Joe (AD4PZ)

- April 9-10
- Harbins Park. We will be live

**Memorial Day Parade:** Earl (AF4FG)

- May 30 – Memorial day
- An HT is recommended.
- Line up and organizing participants.

**Other Business:**

- Joel is looking for a climber to change a rotator. No tower. Moderate pitch to the roof.

**Program:** Bob K4VBM presented part two of digital modes.

### Workshop Minutes - March 15, 2021

Number in Attendance: 17

**Workshop Topic:** Digital Modes for Amateur Radio

**Presenter:** Bob Hensey K4VBM

**Brief Summary:** Again Bob made the rounds assisting those that brought laptops and Jump Kits. Those that didn't bring gear huddled around to watch, learn, and contribute.

We had two smaller groups working on APRS and testing of two HF rigs.



The

## Events – GARS and others

| ARRL CONTESTING INFO   | HAMFEST CALENDAR  |
|--|---|
| <p>From ARRL Contest Calendar<br/>&gt; For more information click the links &lt;</p> <p><b>April 2022</b></p> <p>10 <a href="#">Rookie Roundup – Phone</a></p> <p><b>May 2022</b></p> <p>No planned contests</p> <p><b>June 2022</b></p> <p>11-13 <a href="#">June VHF</a><br/>18 <a href="#">Kid's Day</a><br/>25-26 <a href="#">Field Day</a></p> <p><b>July 2022</b></p> <p>9-10 <a href="#">IARU HF World Championship</a></p> <p><b>August 2022</b></p> <p>6-7 <a href="#">222 MHz and Up Distance Contest</a><br/>21-22 <a href="#">10 GHz &amp; Up – Round 1</a><br/>21 <a href="#">Rookie Roundup – RTTY</a></p> <p><b>September 2022</b></p> <p>10-12 <a href="#">September VHF</a><br/>17-18 <a href="#">EME - 2.3 GHz &amp; Up – Round 2</a><br/>17-18 <a href="#">10 GHz &amp; Up – Wknd 1</a></p> <p><b>October 2022</b></p> <p>17-21 <a href="#">School Club Roundup</a><br/>TBD <a href="#">EME - 50 to 1296 MHz – Wknd 2</a></p> <p><b>November 2022</b></p> <p>5-7 <a href="#">Nov. Sweepstakes - CW</a><br/>19-21 <a href="#">Nov. Sweepstakes - Phone</a><br/>12-13 <a href="#">EME - 50 to 1296 MHz</a></p> <p><b>December 2022</b></p> <p>2-4 <a href="#">160 Meter</a><br/>10-11 <a href="#">10 Meter</a><br/>18 <a href="#">Rookie Roundup–CW</a></p> <p><b>January 2023</b></p> <p>1 <a href="#">Straight Key Night</a><br/>7 <a href="#">Kid's Day</a><br/>7-8 <a href="#">RTTY Roundup</a><br/>21-23 <a href="#">January VHF Contest</a></p> <p><b>February 2023</b></p> <p>13-17 <a href="#">School Club Roundup</a><br/>18-19 <a href="#">International DX – CW</a></p> <p><b>March 2023</b></p> <p>4-5 <a href="#">DX Contest -- SSB</a></p> <p>For more information:<br/><a href="http://www.arrl.org/contest-calendar">http://www.arrl.org/contest-calendar</a></p> | <p>[Please confirm the status of a Hamfest before making plans to attend]</p> <p><b>04/09/2022 - TARCfest</b><br/>Location: Tampa, FL<br/>Type: ARRL Hamfest<br/>Sponsor: Tampa Amateur Radio Club<br/>Website: <a href="http://www.hamclub.org">http://www.hamclub.org</a></p> <p><b>04/23/2022 - Calhoun Hamfest</b><br/>Location: Resaca, GA<br/>Type: ARRL Hamfest<br/>Sponsor: Cherokee Capital Amateur Radio Society<br/>Website: <a href="http://www.k4woc.com">http://www.k4woc.com</a></p> <p><b>04/23/2022 - Mobile Amateur Radio Club (MARC) Hamfest</b><br/>Location: Mobile, AL<br/>Type: ARRL Hamfest<br/>Sponsor: Mobile Amateur Radio Club (MARC)<br/>Website: <a href="http://www.w4iax.com">http://www.w4iax.com</a></p> <p><b>04/23/2022 - Wiregrass ARC - Spring Tailgate</b><br/>Location: Headland, AL<br/>Type: ARRL Hamfest<br/>Sponsor: Wiregrass ARC<br/>Website: <a href="http://w4dhn.org">http://w4dhn.org</a></p> <p><b>04/30/2022 - Fayette Tailgate</b><br/>Location: Fayette, AL<br/>Type: ARRL Hamfest<br/>Sponsor: West Alabama Amateur Radio Club<br/>Website: <a href="https://www.facebook.com/groups/586474361391035">https://www.facebook.com/groups/586474361391035</a></p> <p><b>04/30/2022 - Savannah Area Swap Meet Hamfest</b><br/>Location: Pooler, GA<br/>Type: ARRL Hamfest<br/>Sponsor: Coastal Amateur Radio Society<br/>Website: <a href="http://coastalamateurradiosociety.net/wpW4LHSblog/?page_id=1049">http://coastalamateurradiosociety.net/wpW4LHSblog/?page_id=1049</a></p> <p><b>05/07/2022 - EPARS Tailgate</b><br/>Location: Dade City, FL<br/>Type: ARRL Hamfest<br/>Sponsor: East Pasco Amateur Radio Society<br/>Website: <a href="http://eparsonline.org">http://eparsonline.org</a></p> <p><b>05/21/2022 - Forsyth Ham Tailgate / Swap Meet</b><br/>Location: Forsyth, GA<br/>Type: ARRL Hamfest<br/>Sponsor: 2nd annual event put on by amateurs for amateurs<br/>Website: <a href="http://www.barnesvillega.net">http://www.barnesvillega.net</a></p> <p><b>05/28/2022 - WormFest</b><br/>Location: Pinellas Park, FL<br/>Type: ARRL Hamfest<br/>Sponsor: The Glorious Society of The Wormhole<br/>Website: <a href="https://w4orm.org/">https://w4orm.org/</a></p> <p>For more information: <a href="http://www.arrl.org/hamfests-and-conventions-calendar">http://www.arrl.org/hamfests-and-conventions-calendar</a><br/>When searching by division, remember some states adjacent to GA are in different divisions:<br/>Southeastern: GA, AL, FL Delta: TN Roanoke: NC, SC</p> |



The

| GARS Events Calendar for 2022  |   | GARS Recurring Calendar   |
|--|---|---|
| <a href="#">TechFest</a><br>Winter Field Day<br>Spring Technician HamCram<br>Dog Show Fundraiser<br><a href="#">Georgia QSO Party</a><br>North metro area Fox Hunt<br><a href="#">Memorial Day Parade</a><br><a href="#">ARC/KARC Hamfest</a><br><a href="#">Field Day</a><br>Summer General HamCram<br><a href="#">JOTA</a><br>Fall Technician HamCram<br><a href="#">Maker Faire</a><br><a href="#">Stone Mt. Hamfest</a><br>Holiday Party | Cancelled for 2022<br>Jan 29-30 2022<br>March 26-27, 2022<br>March 30-April 3 2022<br>April 9-10 2022<br>April 2022<br>May 30 2022<br>June 4 2022<br>June 26-27 2022<br>July 2022<br>October 16-17 2022<br>October 2022<br>TBD<br>November 6-7 2022<br>December 14 2022 | <ul style="list-style-type: none"><li>• 2nd Tuesday of the month at 7 pm (except December)<br/>Monthly Club Meeting<br/>690 Airport Rd, Lawrenceville, GA 30046</li><li>• 3rd Tuesday of the month at 7 pm (except December)<br/>Monthly Workshop<br/>690 Airport Rd, Lawrenceville, GA 30046</li><li>• 2nd Sunday of the Month at 2 pm<br/><a href="#">GARS Ham Exam Session</a><br/>690 Airport Rd<br/>Lawrenceville, GA 30046</li><li>• Every Monday at 7:30 pm: GARS Want, Swap, Sell, and Information Net on the GARS 147.075 MHz repeater</li><li>• Every Monday at 8:30 pm: ARES Training on the GARS 147.075 MHz repeater</li><li>• Most Saturdays at 7:30 am :<br/>GARS Weekly Breakfast<br/>Cracker Barrel Restaurant<br/>75 Celebration Dr., Suwanee, GA 30024</li></ul> |
| GARS CALENDAR FOR April 2022   |   |   |

| SUNDAY  | MONDAY                              | TUESDAY  | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY  |
|---|-------------------------------------|--|-----------|----------|--------|---|
|   |                                     |  |           |          | 1      | 2<br>Breakfast at<br>Cracker Barrel<br>in Suwanee<br>7:30 AM  |
| 3   | 4<br>7:30 – 8:00 PM<br>GARS 2M Net  | 5<br>7:00 PM<br>GARS Exec<br>Meeting<br>(Online)       | 6         | 7        | 8      | 9<br>Breakfast at<br>Cracker Barrel<br>in Suwanee<br>7:30 AM  |
| 10<br>GARS VE<br>Exam Session<br>EAA 690<br>Hangar<br>2:00 PM | 11<br>7:30 – 8:00 PM<br>GARS 2M Net | 12<br>7:00 PM<br>GARS Meeting<br>EAA 690<br>Hangar     | 13        | 14       | 15     | 16<br>Breakfast at<br>Cracker Barrel<br>in Suwanee<br>7:30 AM |
| 17  | 18<br>7:30 – 8:00 PM<br>GARS 2M Net | 19<br>7:00 PM<br>GARS<br>Workshop<br>EAA 690<br>Hangar | 20        | 21       | 22     | 23<br>Breakfast at<br>Cracker Barrel<br>in Suwanee<br>7:30 AM |
| 24  | 25<br>7:30 – 8:00 PM<br>GARS 2M Net | 26   | 27        | 28       | 29     | 30  |

## Local Ham Radio Exams & Meetings

### GARS Ham Radio Exams

#### Second Sunday of the month

Doors open at 1:45pm, exams start promptly by 2:00pm

GARS VE-Team

VEC: W5YI-VEC

EAA 690 Hangar

690 Airport Rd

Lawrenceville, GA 30046

GARS VE Team Leaders

E-mail: [exams@gars.org](mailto:exams@gars.org)

#### March 2022 Results

We had a successful exam session on Sunday, March 13. Ten applicants tested. Four applicants earned their Technician license, two upgraded to General, and four upgraded to Amateur Extra.

Thanks to all the VE's who made the session possible:

- Dave Bruse, W4DTR (CVE)
- Bill Cherepy, WB4WTN
- Donna McCord, KM4FMW
- Richard Kitz, KM4SWL
- Don Bagby, KK4NJM (Co-CVE)

73, Chuck, KK4TKJ (Co-CVE)

GARS VE Website: <http://gars.org/exams> has location information and testing requirements.

#### Local Ham Radio Exams

In order to find an exam session near you, please visit [http://www.arrl.org/exam\\_sessions/](http://www.arrl.org/exam_sessions/). Contact the information in the listing for further information.

#### Local Ham Radio Meetings

In order to find a local Ham Radio Club meeting near you, please visit <http://www.arrl.org/find-a-club>. Contact the club for meeting information.





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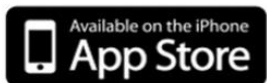
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